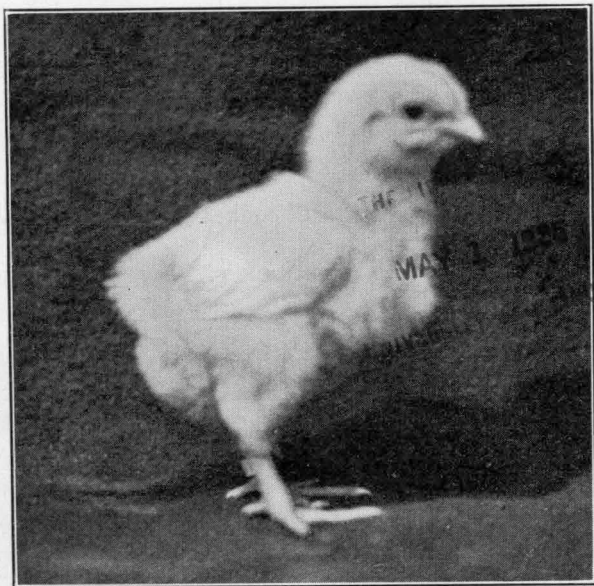

UNIVERSITY OF ILLINOIS
AGRICULTURAL COLLEGE AND EXPERIMENT STATION

Raising Chicks at a Profit

By JOHN VANDERVORT



URBANA, ILLINOIS

Summary of Suggestions for Raising Chicks

Early-hatched chicks will get a good start before hot weather and mature before winter.

Raising chicks on fresh ground away from the farm flock lessens the danger of disease.

Plowing up the ground helps to rid the soil of disease germs and intestinal worms.

Only strong, sturdy chicks develop into profitable, mature birds.

Rigid culling thruout the growing season cuts the cost of raising chicks and lowers the mortality among them.

A movable brooder house with a coal stove in it is an economical means of raising a large number of chicks at one time.

Best results can be obtained if the brooder house is ready, the stove in place, and the heat properly regulated before the chicks arrive.

Resting and hardening the chicks before they are taken from the incubator makes stronger, sturdier stock.

Many digestive troubles are avoided if no solid feed is given for the first forty-eight to sixty hours, in order that the yolk in the chick's body may be partially absorbed.

Danger from overfeeding is lessened if the chicks are fed often and a little at a time for the first few days.

Giving the chicks some form of milk at the start stimulates their appetite and promotes growth.

Vitamins, minerals, and direct sunlight are essential for proper growth and vigor.

A suitable mash, fed thruout the summer, balances the grain ration and keeps the chicks growing without any setbacks.

Early roosting keeps the chicks from crowding into the corners.

Removing the cockerels at broiler age gives the pullets more room to grow and develop. Birds of both sexes will grow better when separated.

Heavy feeding before the pullets are placed in winter quarters gets them in shape for laying during the winter.

Careful culling before the pullets go into winter quarters eliminates many unprofitable birds.

Growing strong, healthy chicks requires the constant, careful attention of the farmer or his wife.

Raising Chicks at a Profit

BY JOHN VANDERVORT, Extension Specialist in Poultry Husbandry

There is no greater poultry problem with which the farmer has to deal than that of raising chicks to be profitable breeders and egg producers. Care of the chicks during the first few weeks is detailed and painstaking work that requires the constant attention of the farmer or his wife. Carelessness or lack of information results in failure. In order to be successful in getting eggs at the time of year when prices are high or in winning at the poultry shows one must know how to get chicks started right. They must be kept growing without setbacks from the time they leave the incubator until they are placed in the poultry house in the fall as mature chickens.

Early-Hatched Chicks Pay Best

Pullets must be hatched early if they are to lay high-priced fall and winter eggs. For this reason early-hatched pullets that get a good start before hot weather comes and that mature before winter sets in are more profitable than late-hatched ones. Early broilers also pay better than do those hatched late.

It is particularly important that a pullet be hatched early and matured properly if she is to be used as a breeder. Small, immature pullets lay small eggs. Chicks hatched from eggs of this kind are handicapped at the start. Then too, pullets not matured before cold weather are likely to be less resistant to disease than those that are well developed.

As a rule, heavy breeds mature more slowly than light breeds. For this reason the best plan during a normal season is to hatch heavy breeds such as Plymouth Rocks, Rhode Island Reds, Wyandottes, and Orpingtons between March 1 and April 15, and light breeds such as Leghorns and Anconas between March 15 and May 15. The time of hatching, of course, will vary somewhat with the particular section of the state and the earliness of the season. Chicks may well be hatched from one to three weeks earlier in southern Illinois than in the northern part of the state.

Sanitation Checks Disease

Sanitation is fully as important as early hatching in successful chick raising. Many common diseases and troubles of both old and young stock can be avoided by following sanitary practices. Proper sanitation means raising chicks on new ground, plowing up and cropping old, con-

taminated ground, and thoro, consistent cleaning and disinfecting of houses and the utensils that are used for feeding and watering.

To get chicks on new ground, brood coops and brooder houses should be moved away from the other farm buildings. They may well



FIG. 1.—ONE WAY TO GET CHICKS ON NEW GROUND

Either an orchard or a near-by cornfield is an ideal place in which to raise young chicks, as each provides plenty of shade, a necessity during the summer.

be put in the farm orchard or near-by cornfield. These are ideal places in which to raise the young chicks, as they provide plenty of shade, which is necessary during the hot summer months.

It is true that extra time and labor will be required to care for chicks when they are away from the other buildings, but the owner will be well paid for this. Chicks will not do well when running with the flock of older chickens. Stunted pullets often result when hens run over the chicks and contaminate or steal their feed.

Vigorous Chicks Essential

Good results cannot be obtained even with early hatching and sanitation unless the chicks come from a vigorous, healthy flock and are large, strong, and sturdy at the start. It is a mistaken idea that one chick is as good as another. Chicks are not all from the best stock nor are they hatched alike. Regardless of whether the chicks are bought from breeders or hatcheries or are hatched on the farm, one of the requirements for success with them is that they be strong and vigorous.

To this end farmers who hatch their own chicks should select their breeding flock carefully. In fact, one of the advantages which the farmer gains by hatching his own chicks is that he can breed and build up his own strain.

If the chicks are bought, it is best to buy from a reliable, near-by breeder or a hatchery with a good reputation. Among the advantages which may be cited for buying chicks instead of hatching them is the fact that there are no incubation troubles to worry about. Then, too, the chicks can be bought as early as one wishes and in large enough quantities so that all the chicks that are needed can be brooded at one time. This is especially desirable, since small chicks are always at a disadvantage when running with larger ones. Another advantage in buying the chicks is the fact that the pullets all come into laying about the same time, since they are all of the same age.

Weak, sickly, and deformed chicks should be killed at the start and rigid culling practiced thruout the season. Weak chicks, those picked out of the shell or showing pasted-up abdomens, never should be kept, as they usually are stunted thruout life. Chicks cured of disease also are often a menace to the flock.

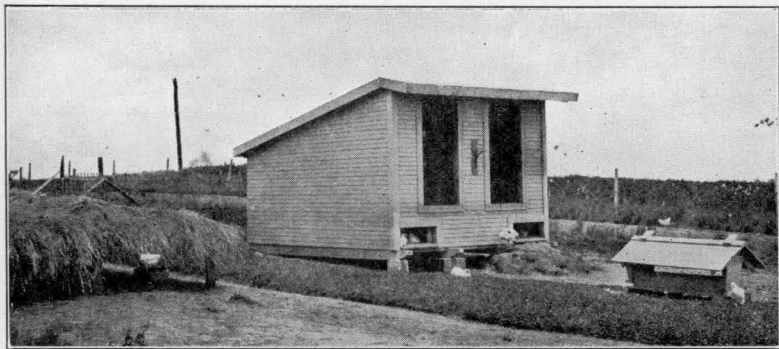


FIG. 2.—A PROVISION FOR ARTIFICIAL SHADE

When natural shade cannot be provided for the chicks they can be protected by means of a straw canopy such as is shown at the left of the picture. Self-feeders such as the one shown at the right save labor. By keeping the hopper filled the flock owner can insure a constant feed supply for his chicks while he is busy with other work about the farm.

Artificial Brooding Economical

Hens cannot be depended upon to hatch and raise many early chicks. As a rule hens from carefully culled flocks will not become broody early enough, nor can large numbers of chicks be raised at one time with hens as economically as with artificial methods. Those using

artificial brooding, however, must have their equipment complete and ready before the chicks are taken from the incubator or arrive from the hatchery.

Movable House Best for Brooding

One end of the hen house or some small farm building may be used to advantage for brooding the chicks, but this will not be so satisfactory as a movable house built especially for brooding purposes. In addition to being movable, a good brooder house should be warm and dry and allow for plenty of light and ventilation. It is a safe rule to have about one square foot of floor space for every three chicks. Experience has proved that it is better not to brood more than 500



FIG. 3.—WHY A MOVABLE BROODER HOUSE IS BEST

Houses of this type can be moved to new ground each year and the chicks raised under the most sanitary and favorable conditions possible on the farm. In this case the sunflowers provide shade for the chicks. The rear ventilator shown in this house is one of its advantageous features.

chicks in one house and best results may be obtained if only 250 are brooded together. Detailed plans and specifications of a 10-by-12-foot colony brooder house may be found in Circular 291 of this Station. If the cockerels are removed at broiler age, this house will accommodate the pullets until they are ready for winter quarters.

Early Preparations Pay

The house should be thoroly cleaned and disinfected a few days before the chicks arrive so that it will be well dried out. A layer of clean, dry sand underneath a thin layer of cut alfalfa, clover, or straw

makes a good covering for the floor. Sand on the floor makes cleaning easy, as the droppings cannot stick. Dusty litter should be avoided, as it is likely to cause sore eyes.

By placing the stove near the middle of the room and slightly toward the rear there will be plenty of room in front of it for feed boxes and water dishes. It is both convenient and best to extend the stove pipe up thru the roof. A metal guard fitted tightly around the pipe and nailed to the roof will help prevent the roof from catching fire from an overheated pipe and also keep water from running down on the stove.

The fire should be started and heat regulated at least forty-eight hours before the chicks are placed in the house. Somewhere near 95

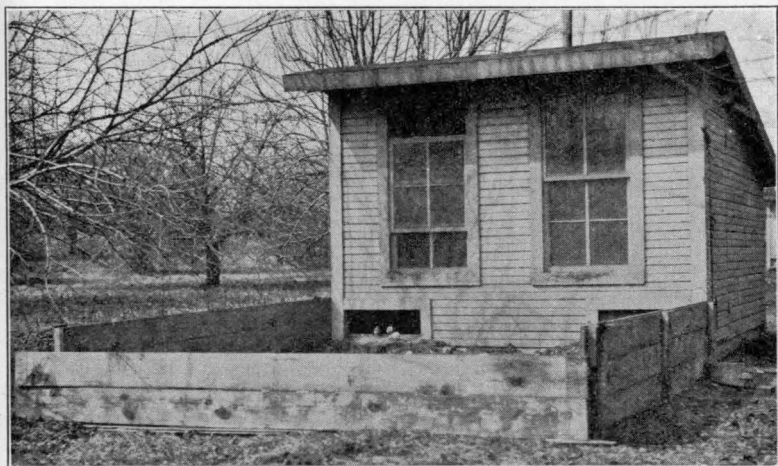


FIG. 4.—A WINDBREAK FOR THE CHICKS

When the chicks are first turned outdoors it is advisable to confine them to a small yard. Fencing this yard with boards protects the chicks from the wind and at the same time allows them plenty of sunlight.

to 100 degrees is the right temperature for the first week, with a gradual decrease of about 5 degrees each week, depending somewhat on the weather. The thermometer usually is hung near the floor at the edge of the hover. It is not, however, an absolute guide to follow.

If the chicks collect around the edge of the hover at night without crowding, it is a sign that the temperature is about right. Wide boards or wire should be fastened across the corners to prevent the chicks from crowding into these corners. For the first few days it is safe to keep the chicks confined near the hover rather than to allow them to wander too far from the heat. A wire guard around the hover one or

two feet from its edge will serve the purpose. This wire enclosure may be enlarged each day and removed entirely when the chicks have learned to return to the hover to get warm.

Coal-Burning Brooder Stove Simple

The coal-burning brooder stove is commonly used and has given uniformly satisfactory results. It is simple to operate and a large number of chicks can be brooded at one time. It also gives plenty of heat thruout the season, while the fire risk with it is slight. The choice of the stove should depend on the reliability and sensitiveness of the draft regulator. Some attention should be paid also to the amount of coal that the stove will hold. Most stoves are adapted for the use of hard coal and best results can be obtained by using coal of this kind. There are a few stoves especially adapted for soft coal. A stove with a 52-inch hover will accommodate 500 chicks and one this large had best be used if more than 250 chicks are to be brooded in one lot.

Medium-sized, or chestnut, coal is better than large lumps or too fine coal. It sometimes may be necessary to use a large-sized stove pipe or to extend the pipe farther above the roof in order to get the proper draft. It is a good plan to shake the fire down every twelve hours until live coals drop down into the ash pan. The ashes should be removed frequently to prevent them from piling up in the ash pan and interfering with the draft. When soft coal is used it will be necessary to attend to the stove and to clean the pipe more often than when hard coal is burned.

The portable outdoor brooder, or portable hover, may be used successfully when a small number of chicks is to be brooded. These are not so satisfactory, however, as the coal-stove brooders, especially during extremely cold, windy weather, which is common in early spring.

With the high price of hard coal, many farmers in this state have found it economical to use the oil-burning type of brooder. Well-constructed, reliable makes are giving good satisfaction and are reasonably safe to operate. This type of brooder is best adapted to a warmly-built brooder house or room, but care should be taken to see that proper heat is maintained during extremely cold, windy weather.

Shallow Feed Boxes Save Chicks

Homemade, shallow boxes make satisfactory feeding troughs for the young chicks. It is true that the chicks can get into low, flat boxes, but if the boxes are taken out after each feeding, they will not get dirty. Chicks can crowd into deep boxes and sometimes are smothered. Metal drinking fountains are all right for water, but earthen or enamel ware is better for milk feeding. All watering and milk-feeding devices should be easy to clean and protected so that the chicks cannot get into the liquid.

Chicks Must Rest in Incubator

Chicks should be left in the incubator until they have become thoroughly dried off and "fluffed out." This hardens them and gives them the rest which they need before they are transferred to the brooder. Darkening the incubator will prevent the chicks from getting restless and crowding toward the front of the machine. Opening the door slightly will allow for some ventilation and help in the hardening process. It is a wise plan to transfer the chicks to the house in such a way that there is no chance of their being chilled.

Common Mistake to Feed Too Soon

Feeding chicks too soon and overfeeding them are common mistakes and the causes of many losses and stunted fowls. The first solid feed should not be given until the chicks are forty-eight to sixty hours old. There is much unabsorbed yolk in their bodies at the time of hatching, and unless this is at least partially absorbed before feeding,

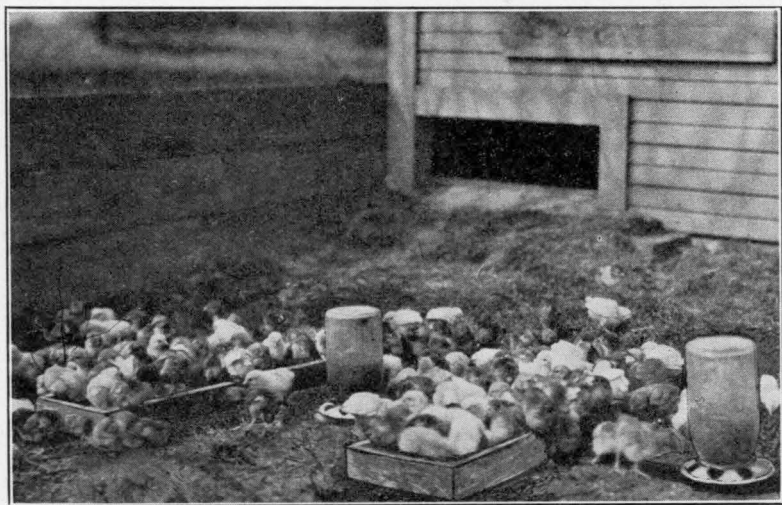


FIG. 5.—A SATISFACTORY TYPE OF FEED TROUGH

Homemade, shallow boxes are better than deep ones because chicks cannot be smothered in them. The low, wide entrance to the house makes it possible for the chicks to get in and out easily without crowding.

digestive troubles are likely to result. The external symptoms of these troubles often resemble those of bacillary white diarrhea.

Some form of milk is valuable for feeding the young chicks at the start. It stimulates the appetite and promotes rapid growth. Experi-

ments show that milk feeding also reduces mortality to some extent. Condensed buttermilk, either in the paste or diluted form, and dried milk products may be substituted for liquid skim milk or buttermilk. It no doubt will pay to provide some form of milk, even tho it is not available on the farm. Bran and rolled oats, either ground or whole, also are good first feeds. Many poultrymen feel that a small amount of powdered charcoal is a good addition to the ration.

Frequent Small Feedings Wise

Under ordinary conditions it is a safe plan to feed at least five times a day for the first ten days or two weeks, giving the chicks only enough at each feeding to keep them busy for about fifteen to twenty minutes. Some grit should be kept before the chicks from the start. This can be fed on boards or in shallow boxes. Water need not be supplied if the chicks have plenty of milk. In order to make each chick drink milk it may be necessary to keep water away for the first few days. Small amounts of grain may be placed on boards or on a clean place on the floor until the chicks are able to find the grain when it is scattered in the litter. The latter practice should be followed as soon as possible to encourage exercise.

By feeding bran or rolled oats often and in limited quantities, the chicks' appetites are satisfied without their being allowed to overeat. If either of these feeds is used, a dry mash should be added gradually after the second or third day, so that at the end of about ten days the chicks will be getting the mash without the addition of any extra bran or rolled oats.

A satisfactory mash for chicks can be mixed as follows, using all parts by weight:

- 2 parts of bran
 - 1 part of flour middlings or standard wheat middlings
 - 1 part of ground rolled oats or sifted ground oats
 - 1 part of finely ground yellow corn
 - 1 part of finely ground meat scrap
- (Add to this mixture 1 percent of salt)

If enough milk is supplied so that the chicks have all they can drink, the meat scrap may be omitted and one-fourth part of bone meal added.

If desired, a moist mash may be given once or twice daily. For this purpose the mixture just outlined may be moistened with water or milk to a crumbly consistency.

Under ordinary conditions it is a safe plan to wait until the chicks are at least three weeks old before keeping the mash before them throughout the day. This mash can be fed up to the age of about six weeks,

after which it is unnecessary to sift the ingredients unless they are extremely coarse. Later, say at twelve weeks of age, the bran may be reduced one-half.

The following grain mixture, all parts being used by weight, has proved satisfactory:

- 5 parts of finely cracked yellow corn
- 3 parts of finely cracked wheat
- 2 parts of pin-head or steel-cut oats

Corn, wheat, and oats may be used in these proportions for chicks of any age, provided the particles are of the proper size and the oat hulls are eliminated until the chicks are about three months old.

If this mixture is fed at least three times daily in the litter for the first few weeks and the chicks are not allowed to fill up at any one feeding, they will be kept active and hungry for the next meal. After the first six weeks the grain need not be cracked finely but should not be so coarse as that which is fed to the old hens.

In case it is hard for the farmer to get ingredients that are fine enough and of the type for home-mixed rations, he may turn to commercial feeds. A commercial starting, or growing, milk mash may contain enough milk so that it is unnecessary and often undesirable to feed liquid milk in addition.

Rations Must Supply Vitamins

One of the main requirements of the ration which the chicks get is that it supply them with the necessary vitamins. It is now known that a lack of vitamins in the feed of chicks prevents proper growth and causes other serious troubles. A ration that lacks these essential elements lowers the vitality of the chicks to such an extent that they are more susceptible to disease.

An absence of vitamin A may cause a disease similar to roup. Sore eyes and blindness have been found to be rather characteristic symptoms of this nutritional trouble. However, chicks that are fed a normal ration with plenty of green feed and yellow corn are not likely to suffer from a lack of vitamin A.

Chicks rarely are undernourished because of a shortage of vitamin B in their ration, but in extreme cases a lack of this vitamin may cause nervous disorders and lead to paralysis. This vitamin is found in natural feeds, including green feed and the embryo and outer covering of the common grains.

Young chicks that are kept indoors are susceptible to leg weakness. This trouble is brought on by the feeding of a ration deficient in the anti-rachitic vitamin and minerals. Calcium and phosphorus are not properly deposited in the bones and consequently the bones do not harden. Direct sunlight which does not pass thru glass has

been found to be effective in curing and preventing leg weakness and in preventing deformities such as crooked keels, provided there are plenty of minerals in the ration. These minerals are supplied in bone meal, meat scrap containing ground bone, milk, green feeds, and limestone grits. Since direct sunlight is beneficial, it is a wise plan to get the chicks out-of-doors as soon as the weather will permit.

When chicks are hatched early in the season and must be confined to the house, the addition of 1 to 2 percent of cod-liver oil to the ration has been found to be effective in preventing leg weakness. The value of the oil lies in the fact that it contains the anti-rachitic vitamin. The oil should be thoroly rubbed into the mash. Only a small quantity should be mixed at a time.

Raw eggs fed at the rate of one yolk daily to each thirty chicks also are beneficial. These may be beaten up in skim milk and mixed with the mash. Care should be taken not to feed raw eggs from hens infected with bacillary white diarrhea, as this is a means of spreading the disease.

A ration for young chicks need not be complicated so long as the chicks can get out-of-doors in the direct sunlight. Careful selection of natural feeds which contain the essentials for proper growth of their bodies usually is all that is necessary.¹ If a system of feeding has proved satisfactory, it is wise to hold to that system and to avoid making sudden changes.

Continued Good Care Necessary

It may be true that chicks are past the danger point after the first six weeks, but if healthy, well-matured pullets are expected in the fall it is extremely important that careful feeding and management be continued thruout the summer months. Young chickens should be taught to roost at as early an age as possible. This will be somewhere near the time when they are weaned away from the heat. Building the roosts low at the start and providing a sloping runway from the floor is a means of getting the chicks on the roosts. Wire netting placed underneath the roosts and sloping runway will prevent the chicks from crowding into the corners. This is important, as many losses occur from crowding, even at this age. The temperature may be reduced gradually until it is certain that the chicks can do without any artificial heat. It may be best to allow a week or ten days for the weaning process.

A hot, stuffy house is a poor place in which to grow young chicks. Some provision, therefore, should be made for ventilating the brooder house thruout the growing season as well as when the chicks are small. Special ventilators can be provided under the eaves. Openings covered

¹Detailed information on vitamin feeding can be obtained in Circular 282 of this Station, *Vitamins in Live-Stock Feeding*.

with muslin will allow for ventilation without direct drafts on the chicks. Windows may be slightly opened early in the season and removed entirely during hot weather, in which case the openings should be covered with wire or muslin.

Sanitation should not be overlooked even tho the chicks are partially grown. The house should be thoroly cleaned and disinfected often. Mites breed rapidly during hot weather, especially under insanitary conditions, and it is necessary to give the house thoro and frequent applications of disinfectant to get rid of them.

Pullets Do Best Away from Cockerels

Unless they worry the pullets too much, cockerels may be left in the brooder house until they reach the broiler stage, when they will weigh from one and a half to two and a half pounds. At this stage those that are to be sold for broilers should be fattened and disposed of, while those that are to go into the breeding flock should be moved to a separate range away from the rest of the flock and well fed thru-out the summer.

Broilers can be confined and profitably fattened for a period of a week to ten days. A ration made of one part of shorts and two parts of corn meal by weight, mixed to a thin batter with sweet or sour milk, is satisfactory.

In selecting cockerels for breeding purposes, it usually is necessary to save about twice as many as will be needed for breeders the following season. These should then be culled out gradually, only those which show promise of becoming desirable roosters being kept. Health and vigor should be the first consideration, while males with crow heads and weak masculinity should be discarded. A bright eye, good comb and body development, and bright, yellow shanks in yellow-skinned breeds are signs of good vigor. The extremely early developing, large combed birds may have small bodies and therefore are not desirable. Young males with deep bodies, wide backs, and sturdy legs are the ones to keep, provided they have the proper color and shape for the breed. In general, cockerels with crooked keels or other deformities and with disqualifications such as side-sprigs should be discarded at the start. Standard characteristics never should be ignored but instead carefully considered when both males and females are being selected for breeders.

Open sheds with high roosts will make suitable roosting quarters for the cockerels after they are on range. It is important that cockerels which are bossed by their mates have a place of retreat, and for this purpose a few roosts out-of-doors should be provided.

Large hoppers may be used for the feeding of both cockerels and pullets on range in order to save labor.

Poor Practice to Slight Pullets

It is a mistake to let pullets forage for themselves, with no particular attention, after they can do without artificial heat. Grain alone will not supply the necessary material for building their framework and bodies. In addition a mash containing a liberal supply of protein and minerals is needed thruout the growing period. Money spent for growing mash during the summer is well invested.

In finishing pullets and getting them ready for a long season of laying it is necessary that there be a supply of fat on their bodies. Liberal feeding of grain and the addition of more corn meal to the mash will help fatten the birds, but this should not be overdone. Over-fat birds will be slow to come into production, and if used for breeders their eggs are likely to hatch poorly. Early-hatched pullets can be safely used for breeders provided they have not been forced too rapidly. It is advisable to move the pullets to winter quarters before they start to lay. Any sudden change in environment or management after they start to lay is likely to cause a slump in egg production.

Disease Not Sole Cause of Losses

All deaths of young chicks are not due to disease. Heavy losses occur from several troubles, the causes of which are often overlooked.¹

Crowding

Where large numbers of chicks are brooded together, there is always danger from crowding and many chicks often are smothered. This is most common at night. The chicks will move away from the hover because of too much heat and then as the temperature drops, they may crowd together rather than move nearer to the heat. To prevent this it is necessary to have the temperature uniform thruout the night.

Later, when the chicks are being weaned and very little heat is provided, there also is danger of crowding, especially on chilly nights. It is best to keep up the heat until all danger from crowding is passed.

Crowding also may occur outside of the house. Chicks that cannot find their way back to the house will crowd into the corners of the yard for protection. It is particularly important that the openings of the house be large so that the chicks may easily and quickly find their way back in, especially when a rain storm comes up suddenly.

¹The two serious diseases of chicks, bacillary white diarrhea and coccidiosis, are thoroly covered in Circular 273, Bacillary White Diarrhea of Chicks, and Circular 288, Coccidiosis of Poultry, issued by this Station.

Bowel Trouble

Any upsets in the digestive system of the chick caused by sudden changes in feeding, improper feeding, chilling, and overheating are likely to cause bowel trouble and high mortality. Many of these digestive troubles can be avoided by keeping the feed away from the chicks for the first forty-eight to sixty hours and feeding them often and little at a time for the first ten days or two weeks. Careful attention to the stove will prevent sudden temperature changes and chilling, which may cause serious digestive troubles and later lead to weakening the vitality of the chicks.

Cannibalism and Toe-Picking

Early in the season when the chicks must be closely confined it is often hard to keep them from becoming cannibals. Toe-picking is a common trouble, while chicks often tear each other to pieces. These difficulties may be due to overcrowded conditions or to a deficiency in the ration. Much of this trouble can be avoided by brooding chicks in small lots, getting them out-of-doors as soon as possible and providing some means of keeping them busy. Plenty of protein and green feed in the ration also are essential. A green sod dug up and placed in the house will help keep the chicks busy.

Attention to Details Counts

Chicks are extremely delicate in the early period of their lives and little things count in their successful care. No recommendations for care and management can give satisfaction without the use of good judgment on the part of the caretaker. Methods which have proved successful in a practical way should be carried out along with a more or less definite plan of management. Common sense and careful attention to details are particularly important in raising chicks to become future profit-makers.

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H. W. MUMFORD, *Director.*